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APPLIED SCIENCES

ASIAN SEMINAR ON TECHNOLOGY TRANSFER OPENS IN BEIJING

OW201306 Beijing XINHUA in English 1254 GMT 20 Apr 83

[Text] Beijing, April 20 (XINHUA)--Asian scientific and technical information experts have gathered here today to discuss ways to facilitate technology transfer among Asian countries and regions.

The week-long seminar, the "Asian Seminar on Analysis of Technology Transfer Opportunities," is sponsored by the Asian Network for Industrial Technology Information and Extension (Technonet Asia), which is based in Singapore.

Fourteen delegates from Bangladesh, China, Nepal, the Philippines, Singapore and Sri Lanka and one from the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) attended today's opening ceremony. Delegates from India and some other Asian countries and regions are expected in the coming few days.

Speaking at the opening ceremony, Dr. Leon V. Chico, executive director of Technonet Asia, said, "This seminar is timely," both for the People's Republic of China and Technonet participating organizations." He said that the biggest problem for technology transfer is that the developing countries are ill-equipped to find, evaluate and apply technologies that are generally already freely available.

In an interview with XINHUA, Dr. Chico said that the network of 14 participating organizations from 11 Asian and Pacific countries and regions aims at improving the quality and efficiency of production in those countries' small- and medium-scale industrial enterprises.

In his speech, Lin Zixin, director of the Institute of Scientific and Technical Information of China, said, "China considers scientific and technological advancement of great strategic importance for economic development. To develop an economy, it is imperative to depend on science and technology and to stress the importance of technology transfer."

He said, "We share the same experiences and aspirations with Third World countries in Asia, and we have today come together to discuss a very important issue--technology transfer--which will certainly cement our cooperation and strengthen the South-South Technology Cooperation."

Wu Xing, member of the State Science and Technology Commission of China, and I. Thomson, counselor (development) of the Canadian Embassy in Beijing and a representative of the International Development Research Center of Canada, which is one of the major donors of Technonet, attended today's ceremony.

A study mission sent by the Chinese Institute of Scientific and Technical Information visited the Philippines, Malaysia, Singapore, Thailand and Hong Kong region, participating organizations of Technonet, in July 1981. In September of the same year, Technonet paid a return visit to China.

Lin Zixin told XINHUA, "The friendly relations between the Chinese Institute and Technonet have been good in the last few years." He said he hoped that their ties with other Asian friends engaged in scientific and technical information would be closer.

CSO: 4010/59

TECHNICAL SERVICES PROVIDED BY SHANGHAI LASER INSTITUTE REPORTED

Shanghai JIEFANG RIBAO in Chinese 18 Feb 83 p 2

[Article: "Shanghai Institute of Laser Technology Provides Technical Services to Localities"]

[Text] Guided by production needs, and using the yardstick of greater economic benefits, the Shanghai Institute of Laser Technology has provided laser technical services throughout the country; it has already provided laser products and new laser technology to users in 28 provinces, and has solved some important technical problems for economic construction. As a result, the State Scientific and Technical Commission recently asked the institute to summarize its experience as preparation for the establishment of a national laser technical services center.

In order to speed up the dissemination and utilization of laser technology, the institute focused on effective developmental research in laser technology. It has signed 34 developmental research contracts with production departments in Shanghai and elsewhere for research on special processes involving lasers, provision of special-purpose laser equipment, transfer of research results and the like, and has striven to achieve short-term economic benefits.

At the same time, the institute has received more than 1,800 work-related visits, letters and telephone calls from localities throughout the country, has sought for principles involving lasers and optics to solve production problems for production departments in many localities, has acted as an advisor, has presented technical programs, suggestions and information, and has performed 160 laser processing tasks for users. In the process of developing a national defense engineering, research and production department, the Sichuan No 1 Instruments Plant had urgent need for a miniature thermocouple, which required the welding of thermal contacts composed of several filaments finer than a human hair. Repeated experiments had produced no results, and this had become a key process, so the plant asked the Shanghai Institute of Laser Technology for help. Following several months of painstaking experiments, the institute's scientific and technical personnel developed a pulsed laser welding process which proved successful, solving a technical problem involved in getting a new product into production. In addition, the institute provided more than 1,000 trial production laser products or sets and sent technical personnel to the

users to perform adjustment, testing, installation and maintenance, which was welcomed by the users.

The institute also publishes the journals YINGYONG JIGUANG [APPLIED LASER TECHNOLOGY] and JIGUANG XIALXI [LASER NEWS] as a technical service to the localities.

8480
CSO: 4008/65

PROGRESS IN LASER HEAT TREATMENT TECHNOLOGY

OW100551 Beijing XINHUA Domestic Service in Chinese 0247 GMT 7 May 83

[Article by Yang Jianwu]

[Text] Wuhan, 7 May (XINHUA)--Information provided at the national laser heat treatment technological exchange and key problems demonstration meeting, held recently in Wuhan, showed that we have made a lot of important progress in the applied research in the new technology of laser heat treatment.

Laser heat treatment is one of the key problems to be tackled by the state during the Sixth 5-Year Plan period. At present, more than 10 scientific research units, institutions of higher learning and production units in the country are conducting experiments on the technology of laser heat treatment of cylinder jackets and piston rings, which are key wear parts of tractor, automobile and various types of locomotive engines, as well as parts and accessories of precision instrument guides and so forth. Some of these parts are now in trial production. Encouraging results have also been achieved in the development of carbon dioxide laser machines, a key equipment in laser heat treatment. Carbon dioxide laser machines of the 100-watt and 1,000-watt class have now progressed from experimental devices into the stage of industrial prototypes with performances approaching or up to international standards.

Laser heat treatment is an advanced new technology for local surface heat treatment that first appeared in the 1970's. By applying this new technology, the service life of tractor engine cylinder jackets can be prolonged about 100 percent, and material cost can be reduced 25 percent.

CSO: 4008/103

RADIO INTERFERENCE STANDARDIZATION PROGRAM EXPANDING

Beijing BIAOZHUNHUA TONGXUN [STANDARDIZATION JOURNAL] in Chinese No 2 1983 p 39

[Article by Yao Lu [2280 2924]]

[Text] Since the official establishment of the "National Radio Interference Standardization Working Group" in 1980, the radio standardization work has expanded systematically and rapidly over many regions. In late October 1982, the first conference to review the national standard of radio inteference was held in Fuzhou. The conference was attended by 46 delegates representing the Ministries of Radio and Television, Posts and Telecommunications, Electronics Industry, Aviation Industry, Water Resources and Electric Power, Railways, Communications, as well as the 33 units of the shipping industry. The delegates carefully reviewed and studied the technical content and test reports in a draft copy of the standard titled "Basic Methodology of Measuring Industrial Radio Interference." It was agreed that the revised draft of the standard "is basically accurate in its technical and scientific contents, and has practical value in designing civilian products; it can also be used in designing military products depending on the particular requirements."

The "Basic Methodology of Measuring Industrial Radio Interference" was written in accordance with the No 16 publication of the special committee on radio interference (CISPR) of IEC, "Specifications on Measurement Equipment and Methodology for Radio Interference," and by partially extracting related articles from international standards used by the Soviet Union, the United States, and Great Britain with considerations given to China's actual conditions. During the process of writing the standards, the draft working group conducted detailed experiments of "interference voltage," "interference power," and "interference time" caused by electric power tools and domestic appliances. The experimental results not only proved the feasibility of the technical requirements in the standard, but also showed that all imported electric apparatus were in agreement with the allowable interference level specified by CISPR, whereas domestic products would not meet the technical specifications of international standards unless interference suppression measures were taken.

"Basic Methodology of Measuring Industrial Radio Interference" is a fundamental standard. It contains nine chapters including "General Measurement Conditions," "Measurement of Conductive Interference Voltage," "Measurement of Conductive Interference Current," "Measurement of Conductive Power," "Measurement of Radiation Interference," "Sampling Techniques and Assessment of Measured

Results," and related appendices. The standard is applicable in measuring the interference of "electric machinery, low-voltage electrical and electronic equipment," "industrial, scientific and medical equipment," "motor vehicles and other spark-ignition devices," "radios and television receivers," and "domestic appliances, electric power tools and similar apparatus." Its frequency range is between 10 KHz and 1000 KHz. In addition, the standard also serves as a reference for establishing the procedure of measuring interference of the equipment mentioned above.

It is expected that with the establishment of the national standard for radio interference, more than 10 other standards including "Microwave Interference," "Measurement Methodology and Allowable Radio Interference Level for High Frequency Equipment Used in Industry, Science, and Medicine," and "Specifications on Measurement Instruments for Electromagnetic Interference Field Strength" will be established in the near future.

3012
CSO: 5500/4143

MAKE CONTRIBUTIONS TO MOTHERLAND, APPLY SCIENCE TO CREATE WEALTH

Beijing RENMIN RIBAO in Chinese 17 Apr 83 p 3

[Text] The State Scientific and Technological Commission's Committee most recently approved 39 items for invention prizes. Aside from the first prize awarded to the superior breed of soybean, Tiefeng No 18, introduced previously in this paper, the following items are reported here for the benefit of the readers, on the basis of information supplied by the State Scientific and Technological Commission.

Gongzhuling Meisu [Gongzhuling Antibiotic]

Gongzhuling Meisu is an insecticide of low toxicity and high effectiveness. Its production cost is low; it does not pollute the environment; and it has no residual toxicity. Its prevention and control effects on wheat stinking smut, bunt of wheat, Gaoliang loose smut and covered smut, spiked-millet Rhizoctonia ear rot, millet smut, naked-oats covered smut, and the Bakanae disease of rice, all caused by seed-carrying fungus, are over 95 percent. This invention was awarded a second prize. It was successfully produced through joint research by Institute of Plant Protection Jilin Provincial Academy of Agricultural Sciences, Yanbian Insecticide Plant, etc.

New Technique of Ion Treatment of Pig Iron Simultaneously With the Three Elements of Carbon, Nitrogen, and Titanium

Surface hardening and corrosion prevention are effective means of improving the life of gray pig iron casting. At present, the "chrome-plating" method is the extensively applied technique. Various new nitriding hardening methods of recent years are mostly for application to steel items and they are seldom used for pig iron. This invention succeeds in realizing a method of adding titanium in the realm of ion heat treatment. A complete set of new work process has been formulated, including innovations with respect to furnace installation, temperature testing, temperature equalizing, etc. With the adoption of this new work process, the wear-resistance of the parts is obviously improved and the wear and tear rate is reduced. Practices with series of cylinder covers and piston rings on more than 20 ships and boats have proved that the life of items [thus treated] is generally 2-3 times longer than items made of domestic alloy steel and they are also better than similar chrome-plated items made in foreign countries. Some of the [treated] items have been

in operation more than 9,000 hours. It is estimated that just the cylinder covers alone, [the invention] may be valued at 10 million yuan. This item is the invention of Yang Lieyu [2799 3525 1342] and his research team at Dalian College of Ocean Shipping. It was awarded a second prize by the state.

New Work Process for the Petroleum Prospecting Ship "Helong"

The new work process for the petroleum prospecting ship "Helong" created by Zhu Yuanjun [4376 3293 6874] et al of Shanghai Ship Repair Plant received a second prize. It is a new construction method used on the "Helong," a large drilling-prospecting ship. When China was building her first petroleum prospecting ship, "Kantan" ["Explorer"] No 3, this technique demonstrated creativeness, progressiveness, and economical reasonableness in opening up a new approach for building ships for drilling and prospecting petroleum on China's seas. Compared with known, foreign, and relatively advanced construction techniques, this technique can save close to 4 million yuan for the state.

Artificial Synthesis of Human Insulin C-Peptide and Radiation Immunologic Analysis Technique

C-peptide determination is an important means of studying the function of pancreatic B cells in the process of diagnosis for diabetes. The work of artificial synthesis of insulin C-peptide and establishing the technique of C-peptide radiation immunological analysis is being carried out in very few countries abroad.

The synthesis technique proposed in this invention produces a rate of 36.4 percent of human insulin C-peptide products, twice as high as the highest rate obtained in foreign countries. The radiation immunological analysis established is simpler than those of foreign countries; fewer specimens are used; the work procedure is easier; the time period is shortened to 48 hours; the cost is lower; the technical indices, such as sensitivity, precision, and accuracy, all reach the same level as those of similar foreign products. Clinical applications in more than 1,000 cases have proved it to be valuable for studying diabetes, hypoglycemia, pancreatic tumor, and other disorders of sugar metabolism. This invention is the product of successful joint research by Lyu Zhi [0712 2784] Liu Zhong [0491 1813] et al of Naval General Hospital and Yang Shizhen [2799 1102 3791], Niu Jingyi [4781 4842 5030] et al of Shanghai Research Institute of Biochemistry, Chinese Academy of Sciences. It received a second prize.

Rare Earth Containing, Chromium, Nickel, Silicon, Nitrogen Type Heat-resistant Steel for High Temperature Furnace

The heat-resistant steel containing rare earth for the use in high temperature furnaces, a product of research by General Research Academy of Iron and Steel, Ministry of Metallurgy, et al was awarded a third prize by the state. The invention provides China an inexpensive and excellent quality heat-resistant steel, capable of being used as the heat-resistant material for various heating furnaces, heat treatment furnaces, and controlled atmosphere furnaces. The working temperature of this steel is in the range of 900-1200°C. It has

excellent oxidation resistance, carburization resistance, sulfur resistance, and corrosion resistance and also has relatively high high-temperature and organizational stability. Its major property indices all reach or surpass the comprehensive properties of high nickel steels of the world. It is currently one of the most economical steels made here or abroad. The adoption of this invention will produce an economic benefit of more than 1,330 million yuan a year.

Ion Exchange Method of Producing Potassium Dihydrogen Phosphate

Potassium dihydrogen phosphate is a new soluble, fast acting, phosphorus-potassium fertilizer. Previously, the neutralizing method was adopted mostly to produce potassium dihydrogen phosphate and the high cost largely limited its application in agriculture. This invention is a piece of new chemical equipment used to produce potassium dihydrogen phosphate to cause the consumption of raw materials and power to be reduced more than one-third, compared with the neutralizing method. It also has its own characteristics, compared with the iron exchange method in foreign countries.

This invention includes an installation capable of producing 1,500 tons a year, and it is in normal operation now. There are also more than 20 plants requesting this technique. At the estimate of an annual production of 4,000 tons, the direct profit will exceed 1 million yuan.

This method is the result of successful research by Chen Zemin [7115 3419 3046] et al of Hubei Research Institute of Chemistry. It was awarded a fourth prize.

6248
CSO: 4008/91

ANSHAN COMPANY HOLDS SCIENTIFIC WORK CONFERENCE

SK250904 Shenyang Liaoning Provincial Service in Mandarin 1100 GMT 24 Apr 83

[Text] The Anshan Iron and Steel Company held a scientific and technological work conference, which opened on 31 March and concluded on the afternoon of 23 April after a 21-day session. In an effort to reform the company's science and technology management system, the conference focused on studying and exploring ways to establish a scientific and technological work headquarters, widely institute the contract system in scientific and technological work, transfer scientific and technical personnel in a planned manner and popularize and apply scientific research findings.

The conference was the largest-scale and longest one ever held by the Anshan Iron and Steel Company since the PRC's founding. The way the conference was conducted was also new. It changed the past method of making leading persons deliver reports and model workers introduce their experiences to the participants, who do nothing but listen. The conference held only three plenary meetings on 3 days. During the remaining days of the conference, the delegates were divided into more than 500 groups, with mines or plants as units, to thoroughly study 6 special topics in their spare time and to work out specific plans for the reform. Such a way of conducting a conference is itself a reform and is very suitable for a large enterprise with a great number of scientific and technical personnel, like the Anshan Iron and Steel Company. It can further develop democracy and boost the enthusiasm of scientific and technical personnel because their opinions are heeded more attentively, thus giving play to the intellectuals' role.

The Anshan Iron and Steel Company has more than 20,000 scientific and technical personnel, of whom some 12,000 are assistant engineers or higher. Attending the conference were scientific and technical personnel and a few leading cadres, totaling over 12,500. After hearing opinions offered in a democratic way from many sources, 27 experts, high level engineers, engineers and plant directors spoke at plenary meetings, and 82 scientific and technical personnel delivered their written reports to the conference.

On the afternoon of 23 April, the party committee of the company summed up the conference and announced a decision on effecting a series of reforms in the company's present scientific and technological work.

CSO: 4008/101

AUTOMATION SOCIETY VIEWS MACHINE INDUSTRY AUTOMATION PROSPECTS

Beijing JIXIE GONGYE ZIDONGHUA [MACHINE-BUILDING INDUSTRY AUTOMATION] in Chinese, No 1, 1983, pp 1-10

[Article by the Secretariat of the Society for Automation of the Machine Building Industry: "Present Situation and Future Outlook for Automation of the Machine Building Industry"]

[Text] This magazine began in its fourth issue of 1981 a special column on "a discussion about the present and the future outlook for the automation of the machinery industry." We have received many letters from readers. The letters used typical cases to analyze and discuss the readers' own viewpoints. Because of the limited space, they could not all be published. In this issue, we have published an article entitled "A Discussion on the Present and Future Outlook for the Automation of the Machine Building Industry" written for the 34th Anniversary Conference of the Chinese Machine Engineering Society by the Secretariat of the Society for the Automation of the Machine Building Industry of the Chinese Machinery Engineering Society as a summary of these discussions. (Editorial Department of this magazine)

Over the past 32 years since founding of the nation, automation technology has been applied and has undergone a definite development in all sectors of the machinery industry as the national economy and science and technology developed. At present, the national economy is in a period of readjustment. The productive capabilities of ordinary machinery products of the machinery industry is now temporarily greater than market demand, and finding out which products the market needs has become the main focal point of the enterprises at present. The increase in the number of unemployed youths and a surplus of labor have become heavy burdens upon the national economy. In face of this sharp conflict, many people have doubted automation. Some automation projects misfired, their cases have been widely noted by society, and this has caused people to believe in the misconception that automation is worse than manual operation. Thus, various opinions concerning automation of the machinery industry such as "our nation has a large population, do we need automation?", automation conserves labor, what can be done about surplus labor?", "automation has made many mistakes, it does not have any practical value," etc. Do we want automation in our machinery industry, what does automation of the machinery industry involve,

what benefits are brought about by automation, how can we summarize past experience and lessons and plan our future? For this, the Society for Automation of the Machinery Industry and the Automation Information Network for the Machinery Industry organized a survey of the domestic situation in the automation of the machinery industry, and held a meeting to discuss the present situation and the future development of automation in the machinery industry at Beidaihe in August, 1981. This article is a preliminary discussion of the above questions on the basis of comprehensive analysis and investigation. We have also presented our suggestions to the leadership.

I. The Function of Mechanization and Automation in Developing the National Economy

(I) Mechanization and automation are needed in the four modernizations.

The general task of the party during the present stage is to develop the national economy and quickly build our nation into a strong and modernized socialist nation, and this is also the wish of our nation's billion people.

At present, how to improve our nation's labor productivity is a fundamental question, and the most effective and most fundamental measure to improve labor productivity is to realize mechanization and automation of productive labor.

By advancing from manual labor to mechanization and automation, from the automation of one unit of equipment to an automated production line, we can improve labor productivity by several times and several dozen times.

(II) Automation is an objective need in the development of science and technology.

Everyone knows that manual labor in a production system that is not automated is limited by man's speed of movement, man's reaction speed, physical strength and persistence and such human physical functions. To further improve production speed, we will surely encounter human physiological limitations. On the other hand, in modern production processes, more high temperature, deep freeze, high pressure, ultrahigh pressure, vacuum and radioactive technologies are used. In these environments, people cannot work. And as the scale of large industrial production becomes larger, comprehensive technologies become more complex, they cannot be directly managed and controlled by man. Therefore, automation is an objective need in the development of production.

The emergence of telescopes, microscopes, X-rays, cameras, recorders, televisions and video recorders have expanded man's vision, hearing and memory. The development of computer technology has improved man's memory, computation, analytical judgment and control and management abilities further. The emergence of the mechanical hand and the robot has realized artificial intelligence. These have all greatly surpassed man's mechanical characteristics. The production processes that could not be controlled

originally because of human physical and physiological limitations have now been overcome. The development of such production technologies has also provided a material and technical basis for realizing automation.

(III) The results of automation is multifaceted. The goal of automation is not purely to save manpower.

In the machinery industry, the term "automation" was first proposed by the "automation department" founded by the American Ford Company in 1947. That department and the Cross Machinery Manufacturing Company cooperated and jointly researched and designed an automatic production method: metallic materials or semi-finished products were transported not by man but were automatically moved in order along with the production process and they were continuously and automatically processed.

Afterwards, this type of automatic production method was called the "Detroit style automation" because that company was in Detroit. Therefore, at the time, it meant the continuous method of processing and automatic flow of the production process.

For several dozen years, as various types of cybernetic theories and control techniques developed, the meaning and content of automation in the machinery industry also continued to evolve and expand. The definition of "automation" is not uniform, it is determined by the actual characteristics of automation. For example, in production, the use of instruments and meters to realize automatic inspection and testing during the production process (such as measurements, recording and display), automatic adjustment or automatic control, automatic signal locking (such as automatic protection) to replace repetitive tasks by man can all be called automation.

Automation of the machinery industry usually includes three aspects, i.e.:

(1) automation of products of the machinery industry;

(2) automation of the production process in the machinery industry;

(3) automation of business management in the machinery industry.

Automation of the production process in the machinery industry can also be divided into 7 main aspects. They are: automation of product design, automation of preparations for production processing, automation of the manufacturing (processing) process, automation of assembly, automation of inspection and testing, automation of production management and automation of auxiliary production processes (warehousing, transportation).

The results of automation can be summarized by the following aspects.

1. Automation can guarantee the quality of processing, repeatedly realize high precision products or realize highly accurate control.

According to recorded statistics from January to October, 1979, of the automatic processing line for lids at the x x plant, a total of 192,000 pieces was produced including 112 rejects, constituting only 0.58 percent. This cannot be realized by other production methods. Also according to investigation of the 55 casting works shaping lines in Shanghai City, the interior defects of castings were few, the precision of the dimensions and the surface shine generally are 1 to 2 magnitudes higher than hand crafted forms.

Numerically controlled machine tools used to process spare parts with complex surfaces can improve the precision of processing and guarantee repeated precision, thus correspondingly reducing the work hours for assembling products. For example, the key spare part of the flowmeter used in the petroleum industry is the non-circular gear. It must be processed by the gear shaper and then a skilled worker must grind it for a day, and the percentage of qualified products is only 60 percent. When using a numerically controlled non-circular gear slotter for processing, grinding was unnecessary after processing and the percentage of qualified products was raised to 99 percent.

2. Automation can improve labor productivity

According to investigative analysis of the typical automated processing line for machinery, the use of the automated processing line can improve labor productivity 2 to 4 times. This was calculated when the load of the automated line was not high and the actual productive output was low.

According to statistics, the productive efficiency of spare parts processed by numerically controlled machine tools generally is improved 0.3 to 19 times. The more complex the surface form of the spare part, the higher the productive efficiency. The productive efficiency in processing the non-circular gear mentioned above by the non-circular gear slotter can be improved 11 times.

The Shanghai Electrical Cable Plant used a computer to automatically test resistors, capacitors, cross-talk and K value of communications cables, and for data analysis, data processing, display and recording the results. The total work efficiency showed an improvement of more than 10 times over that of manually using the electric bridge for testing.

Also, for example, the heat treatment shop of the Luotuo Forging Plant used an automatic hardness classification device. It improved productive efficiency by 10 times. The quality basically can reach 100 percent.

3. Automation can save operating costs and reduce cost

According to typical investigative analysis of automated lines for machinery processing, if we take the amount of annual savings in the cost of processing [= operating cost of the original year - current year's operating cost] as the basis for our calculations, generally the investment

in building the production line can be recovered in about 4 years. If we take the annual profit [= (price of spare parts - cost of spare parts) x annual output] as the basis for calculations, the investment in building the production line can be recovered in 1 to 2 years.

Some production plants that manufacture large batches mainly rely on automation of single machinery units to improve labor productivity and reduce cost. For example, the Tianjin Radio Plant No. 9 used manual operation in 1965. It produced 1. 3 million resistors annually at a cost of 0.11 yuan each. In 1979, it began mechanized production. Annual output was 85 million units, an increase of 60 times and the cost dropped to 0.04 yuan per unit, a drop of nearly 8 times. In 1980, it realized automation of single machines and its annual output reached 190 million units, another increase of 2.2 times. The labor productivity in 1978 was 30,000 units per month per person. In 1981, it was 80,000 units per month per person. Now, the quality of resistors produced by that plant is good, a lot is exported and they have been recognized by General Electric of the United States and they have been issued an inspection-free certificate.

4. Automation can improve working conditions, reduce labor intensity and guarantee safe production.

For example, the characteristics of hot processing is hot, dirty and tired. Sometimes there is danger. The working conditions in hot processing shops are poor, the percentage of cases of arthritis, heart attack, nervous breakdown, tuberculosis, and hepatitis is high, the workers' working life is short, and there are no successors. According to an investigation of 51 automated single machines and the automatic hot processing line at 9 factories in Luoyang City, all those that use normal automated projects have greatly improved working conditions and reduced labor intensity, labor productivity has at least improved onefold, and the investment in technical improvement could be compensated for within 1 to 2 years.

The hot processing procedure of saw blades at the Shanghai Measuring Instruments and Cutting Tools Factory required workers to use a hook to lower the blades into a high temperature sale bath furnace. Each operating shift lasts 6 hours, each worker cumulatively places an average of 2,400 kilograms of blades into the furnace. Labor intensity is high, working conditions are poor, and now a mechanical hand has replaced manual labor.

5. Automation can improve the standard of business management.

The C_4 machine installed in 1974 by the Computation Center of the Ministry of Machine Building has begun operation and has begun to compile various forms and tables. It compiles production statistics and summaries of more than 100 major products of enterprises, examines the implementation of contracts, and prints daily reports, ten-day reports, monthly reports.

The efficiency in placing orders and distributing bearings and automobile accessories and some products has been improved 20 times. The distribution plan can be adjusted according to need, and a distribution plan can be changed in about 5 to 6 hours. In this way, many plans can be prepared for selection and this improves the management standard.

The First Automobile Plant is the earliest enterprise to use a computer in business management. The C_2 computer is used to compile production operation plans and statistics on output, production values and to calculate specific costs. It has improved quality and efficiency. Formerly, compiling a plan for a branch factory requires 20 days to one month, now compiling the quarterly plans for 21 branch factories of the entire plant requires only 5 days. Calculating the production value and cost of more than 2,000 spare parts of 7 branch factories requires only 1.5 hours. This greatly reduced repetitive labor and burdensome manual calculations. In addition, it also calculates wages for all the workers of the plant, etc.

At present, the use of computers in business management is still very infrequent. As the system is reformed and as rules and regulations are perfected, management level will improve, and the computer will serve a greater function.

6. Automation can complete calculations that man cannot finish, shorten the period of design tests and hasten the replacement of products.

In the past, our method of producing new products was to design, manufacture a model, test, improve, retest, and the military industries have used the method of drawing - processing - targeting for a long time. The period for designing and trial manufacturing was long, by the time the products take shape, they are already behind in performance. Today, the computer is used to aid design, we can conduct numerical simulation on the computer, use images to display the results of designs, revise the designs at any time until we obtain a satisfactory result. For example, without the use of computers, the calculation of the effects of the parameters of the steam turbine engine, the analysis of the harmonics of electrical resistance, the comparison of many plans for the internal combustion engine of the boiler at power plants, the design of complex cutting tools, the matching of the gear box for machine tools would be very difficult to solve manually. The comparison of several dozen plans, the calculation of 2,750 types of transmission ratios, the handling of over 30,000 groups of data on the inner slotting knife without the aid of computers could never be completed manually.

Since 1979, large structural analysis programs have been installed on three imported computers with 512K. They solved the old, big and difficult problems in design calculations. For example, they have created preliminary and decisive conditions for the successful development of such products as the chasis of large trucks, the front beam of the horizontal extrusion machine, the body and chasis of automobiles, the separating plates of blades of steam turbines, the stress analysis of large structural components of large generators, etc. The period of development of new products has been shortened, and a lot of experimental work has been eliminated.

7. Automation can save energy.

For example, some enterprises reformed the regulation of boilers with the help of scientific research units. Results of operation have been good and thermal efficiency could be improved 10 percent. The coal grinder consumes the most amount of electricity in thermoelectric plant. It is a "tiger that consumes electricity." The Automation Institute of the machine building industry conducted tests and improved the automatic regulation plan. Consumption of electricity was reduced 8.8 percent, and the coal grinding capability of the steel ball grinder was improved 7.6 percent.

(IV) Realizing mechanization, automation, improving labor productivity to the maximum extent are fundamental measures to solve the problems in employment.

The development of production and economic prosperity are all related to mechanization and automation. Only if the results of automation improve labor productivity and accumulate more capital for the state is it possible to improve people's life and develop production. Production promotes consumption and consumption promotes production, forming a benevolent cycle. When the state has savings, when the collectives have capital, more factories and service professions can be established to provide more employment opportunities. Thus many ways are opened up, the economy is enlivened, and the difficulty in employment is fundamentally solved. Conversely, if we abandon automation, if everyone relies on low efficiency, the more people there are the lower the production rate, and if this continues for a long time, it will form a vicious cycle, and finally the state will become poor and employment will be even more difficult.

In view of the above analysis of so many facts, we can conclude that mechanization and automation are needed in the four modernizations, and they are important means to improve labor productivity. As science and technology develop to the present day, realizing automation has become an objective need to develop production. Relying on the senses and the limbs to operate machinery can no longer satisfy modern requirements. A large population cannot realize the various goals that can be realized by automation, therefore the view that a large population makes it unnecessary to engage in automation is a very unilateral and mistaken view.

II. The Basic Situation and the Main Experience and Lessons in the Automation of Our Nation's Machinery Industry

The more than 20 years of development of automation in our nation's machinery industry have been similar to that of foreign nations. We started out from the automation of the production process, began from production of large batches of similar types of products and gradually solved the problems of automation of medium and small batch production of many varieties. We also began from cold processing and gradually

expanded to hot processing and special technological processes. Then we expanded to the automation of the processes of product design. In recent years, we began automation of business management and conducted research in the realm of modernization and automation technology, the theory, method and means that are being continually developed abroad. In these regards, we have also begun some research work. The following is an analysis of several major aspects.

1. Automation of Single Machines and Specialized Machine Tools

Automated single machines and specialized machine tools are used the most in the machinery industry. Many factories automated burdensome manual operations to reduce labor intensity, successfully designed and automated a large number of single automated machines and special purpose machine tools. These are used more commonly, and the results have also been good. They will not be described one by one here.

2. To solve large batch production, various types of automated production lines have been established.

Our nation began in 1958 to develop automated lines for machinery processing. By the latter part of the 1960s, automated lines such as the 308 bearing automated production line began production and use. By 1980, according to investigation conducted by the joint investigating group of the former First Ministry of Machine Building and the Ministry of Agricultural Machinery, the First Ministry of Machine Building and the Agricultural Machinery Ministry owned a total of 477 automated machinery processing lines, 266 of them were inspected on site by the investigative group. Of these 266 lines, those normally used constitute 44.7 percent. These types of automated lines operate more steadily in production, there is less breakdown, and they have realized better economic results. Those that are basically normal constitute 18.5 percent. These refer to those that can produce qualified products but their actual production does not meet the requirements, they frequently breakdown during operation and the malfunctions can be eliminated in time. Those that are being used at a lower level of operation constitute 7.1 percent. Those that have not been used after completion constitute 25.9 percent. Those that should be written off constitute 3.8 percent. All those that can be used normally have improved labor productivity, reduced cost, and reduced labor intensity.

In addition, 402 various types of casting and shaping production lines have been completed one after the other (in Shanghai alone, there are 55 various types of casting and shaping production lines), and there are some hundred hot treatment lines, electroplating production lines and some semi-automated and automated assembly lines, etc.

3. Numerical control technology has developed to solve medium and small batch and single unit production in the machinery industry.

Our nation began in 1958 to study the technology of numerically controlled machinery processing. In the 1960s, we developed the numerically controlled wall awl milling machine for such complex shapes as the wall awl and non-circular gears and the numerically controlled non-circular gear slotter. They guaranteed the quality of processing, reduced rejects, enabled production efficiency to improve 10 times, and realized good results. Since the 1970s, efforts have been aimed at the urgent need for processing spare parts of complex shapes in the aviation industry, and since 1973, joint efforts to develop numerically controlled machine tools were organized. After three years of efforts, more than 300 numerically controlled machine tools of over 10 varieties were trial manufactured by 1975. According to information provided by the State Bureau of Statistics, in the 7 years from 1973 to 1979, a cumulative total of 4,108 numerically controlled machine tools had been manufactured throughout the nation. The sector belonging to the former First Ministry of Machine Building cumulatively produced 980 units, constituting 23.8 percent. Among the more than 4,000 numerically controlled machine tools, it is estimated that more than 3/4 are numerically controlled cutting machine tools. In technical level, our nation has generally reached the technical level of the latter part of the 1960s of foreign nations. According to many investigations of numerically controlled machine tools our nation already has (including those imported), generally speaking, those that can be used normally constitute about 1/3, those that cannot be normally used also constitute 1/3, and the remaining 1/3 cannot be used or has not been installed or adjusted, or are still in the factories. The reasons that created the above situation are generally the following: (1) poor reliability, low efficiency; (2) high price, compared to similar ordinary machine tools, the selling price is generally 10 times higher, and even more than 20 times higher; (3) people do not know how to use them, therefore, even if the numerically controlled machine tools can operate normally, frequently they cannot be effectively used; (4) equipment distribution is improper, after arriving at the factory, they are put aside and not used because there are no suitable processing of spare parts.

4. Application of computers

In 1963, the sector of the First Ministry of Machine Building began to use computer technology. It first used such technology in design calculations for products. The application has always been better. At the beginning of the 1970s, computer technology began to be used in data processing, process control, software debugging, automatic testing, and business management. According to incomplete statistics, at present, the sector of the former First Ministry of Machine Building owns 147 computers (not including microcomputers), 124 of them are domestically manufactured machines and 23 are imported computers. There are a total of 53 varieties, 10 analog computers, and the remaining 137 computers are all digital computers. There are nearly 1,000 workers in computer applications who are involved in the development of software and hardware maintenance. In addition, the application of microcomputers is becoming more popular.

Of the 147 computers, 47 are used for scientific research and design. This is because scientific research and design calculations use only the computer as a substitute for other tools. As long as we grasp the method of using the computer and learn how to compile programs, we can perform calculations quickly and the precision of computation will be high. Therefore, this aspect has been popularized quickly and the results have been visible. Secondly, there are computers for software debugging (a total of 31 computers) and data processing (a total of 27 units). Although quite a few are used on process control (24 units), the rate of success is not high. The number of computers for business management (a total of 8 units) constitutes a relatively small portion. According to related data, the percentage of computers used for business management abroad constitutes about 70 percent to 80 percent. The situation is the opposite in our nation at present. This is an indication that our nation's industrial and business management are backward. Now, the First Automobile Plant and the Beijing Automobile Plant are test points for mass production. The Shanghai Machine Tool Plant and the Shenyang First Machine Tool Plant are points for batch production. The Hangzhou Steam Turbine Plant is a point for single unit production. How can we strengthen leadership so that they can progress faster and so that we can acquire some experience is a question worth studying.

5. The application of industrial robots (mechanical hand)

One of the important means of automation as an auxiliary to the production process is the mechanical hand. It emerged in the 1960s or sometime earlier along with the automated machine tool and automated production line. But there are not many. At the beginning of the 1970s, the industrial robot became the center of attention as a special academic field and developed. According to statistics of several major provinces and cities, there are more than 1,000 industrial robots at present. Most are specialized mechanical hands. There are only about 60 general purpose mechanical hands.

It can be seen from the above that since founding of the nation, the achievements realized by automation have been great. Various types of automated single units of machinery, automated production lines, numerically controlled machine tools, industrial robots and computers have served importantly in their application in the various realms of the machinery industry and in improving the labor productivity in the machinery industry.

(II) Main experience and lessons

With the development of automation in the machinery industry during the first stage, we have acquired a definite technical and material foundation, and trained a team of specialists in the study of the technology and application of automation. But development at different places, in different sectors and units throughout the nation has not been balanced. Even in places where such work has developed well, the sectors and units have not popularized the application of automation, there have not been

many scientific research results, and more applications still remain in the testing stage. Therefore, we can say that we are basically still in the initial starting stage. We have deviated because of insufficient experience. Today, it is necessary to summarize the situation in retrospect to avoid repeating the same mistakes.

1. We must start out from the fact that our nation "has a large population and a weak foundation." We must start out from the actual needs in production, overcome onesidedness in applications, such as unilaterally emphasizing the conservation of manpower, unilaterally pursuing "sophistication, precision, pioneering fields," etc. We should seek truth from facts and consider economic benefits.

For example, in February, 1973, Beijing City organized scientific and technical personnel and teachers from concerned research institutes, universities and factories to carry out the directive by the city's leading comrades to establish several "models" in industrial automation. They conducted investigations and studied the question of establishing test points for automation of the machinery industry. They chose the "May 1" brand general purpose machine tool of low efficiency and selected the object for processing that typified the "one man, one machine, one part, one procedure, one job" work procedure as the subject of study. Because of the principles, policies and guiding ideology for scientific research at the time emphasized "catching up and surpassing" and independently pursuing technical levels, they abandoned the practical techniques of using numerical dimension display and electronic technology to rebuild old machine tools in order to establish a "test point," and selected disk type spare parts that were manufactured in medium and small batches. They developed the new research subject of the DNC group controlled lathe system, and developed a new lathe according to the requirements of the new products and technological processes for processing spare parts. They spent a lot of effort, five years and 900,000 yuan to build a DNC group control system for two lathes. Although in principle they proved that this system could improve productivity by many times, the system's components (including electronic devices) were poor in quality and reliability, and they were affected by environmental temperature. There were many problems in the comprehensive reliability and stability of the system. After it began operation, it had to be shut down and restarted frequently and it did not reach the expected goal.

Also, for example, the turning wheel support shop of a certain automobile plant set up an automatic processing line to manufacture axile rims in 1975 to save manpower. The production line had a total of 9 lathes in three sections. There were three conveyor chains, two mechanical hands, three hydraulic stations, three control panels, and 31 electrical motors with total power of 81.7 kilowatts. After completion, it could reduce the labor force by 7 people. It was estimated that after 3 years of operation the one-time investment could be recovered. At the beginning period of operation, the output per shift increased twofold. But because the quality requirements for the axle rim were not that high and because the mechanical hands were inconvenient to use, the hydraulic station

frequently leaked oil and the electrical control system frequently malfunctioned and had to be shut down for inspections, workers complained that "it was spending money to invite trouble." Later, the operation returned to the original way and axle rims were produced by single machines.

2. We must follow scientific laws and economic laws, we must not be anxious to achieve and rush ahead. We must also overcome the urge to rush ahead to follow new foreign trends and then withdrawing immediately after encountering problems.

For example, in 1960, technical reforms and a technical revolution movement centered around mechanization, semi-mechanization, automation and semi-automation were launched throughout the nation. Automation of the machinery industry was placed at an important position. They greatly promoted the development of automation technology and some achievements were realized. A small number were firmly established and improved and there were also many lessons. Frequently when a movement is launched, the subjective and objective conditions are neglected. Everyone pursues goals without considering quality, scientific laws and economic results (the slogan of "working hard for x x days, realizing x x projects," "ten thousand projects, one thousand machines, a hundred lines"), and a lot of waste was created. Most results could not be firmly established and they were abandoned half way. Some even damaged the reputation of automation. This way of doing things was still being practiced in some regions even in the 1970s.

Also, for example, the sector of the former First Ministry of Machine Building had 24 computers used for process control. But not many could be used persistently and could truly produce results in production. This was because there were no unified plans that decided what to do and how to do it. As a result, efforts were frequently begun quickly and abandoned quickly, creating a great waste of manpower and materials. For example, a certain machine tool plant used one computer to exercise centralized control of four processing centers. Because the quality of the processing centers was poor, the use of the computer had to be terminated after spending an investment of over 2 million yuan.

3. We must concretely grasp the basic technologies and basic components and improve the quality of basic components.

Many automation projects could not operate normally and were difficult to use in production because the basic technology did not function well and because the quality of the basic components was poor. For example, the sector of the former First Ministry of Machine Building owned 114 domestically manufactured computers. Most of them were of poor quality and they could not operate normally. Some machines malfunctioned an average of every two hours, and they were shut down most of the time. This situation naturally hindered the development of computer application.

Because the quality of electrical components and hydraulic components was poor and the useful life was short, they seriously affected the operation of automated equipment. For example, the automated production line for processing the CH-2X13 main spiral gear blanks at the First Automobile Plant has had too many electrical malfunctions and it has not been able to begin production since it began test runs in 1977. Of the 266 automated production lines of the former First Ministry of Machine Building and the Ministry of Agricultural Machinery, 25.6 percent of them were forced to operate at a lower level because of frequent breakdowns, poor reliability and unstable operation. The problem is very serious.

The work of unifying industrialization, automation and mechanization of frequently used basic components and general purpose parts is weak. It was allowed to develop freely and this caused difficulties in organizing specialized batch production, affected quality and cost, and brought about a series of difficulties in the equipment of automated systems, design, manufacturing, installation, testing, use and maintenance etc. For example, for hydraulic components, there are two main sets of relatively complete standards drawn up by the Guangzhou Hot Belt Machine Tools Research Institute and the Dalian Combined Machine Tools Institute for medium and low pressure components. They are not interchangeable and they are separately manufactured and supplied by several dozen factories throughout the nation. In addition, there are the standards of the Yuci Hydraulic Components Plant and the old standards of the Soviet Union. About 24 types of 429 hudraulic components are used on an automatic processing line for cylinder lids at a certain factory, including the Yuci type, Guangzhou type, Dalian type. They have caused a lot of inconvenience for the users.

4. We must strengthen management and train personnel

After an automated equipment begins production, the ability of the equipment to work reliably depends to a large degree on whether management is appropriate and whether it is assigned necessary technical personnel to perform routine maintenance. For example, the Third Machine Tool Plant in Beijing used separate germanium components in 1970 to develop an automatic dimension control digital display with coordinates and preselected light grid. It was used in the horizontal boring lathe. The temperature of the germanium transistor tube shifted severely, its ability to resist interference was poor, but because technical personnel insisted on eliminating the various malfunctions in time in the course of use and made improvements, the machine was improved from one operating on the "one shift system" to a machine that operated on a "three shift system." After eight years of stable operation, it improved efficiency by 50 percent. This shows that if we strengthen management and pay attention to training maintenance personnel, even with our available technical foundation, we can still enable automation technology to serve the machinery industry well.

III. The machinery industry is a scattered manufacturing system. Its problem of automation and automation of the production processes which are already continuous at present (such as metallurgy, petroleum, chemical industry, power stations) are different in many aspects.

First, the measuring components and the execution mechanisms of the production processes of the machinery industry are different from the temperature gauge, pressure gauge, flowmeter and valves used in continuous production processes. The flow process industry has already progressed ahead while on-line measuring and some execution machinery of the machinery industry (such as industrial robots, piling cranes, unmanned conveyors) are relatively weak. In addition, problems of rigidity, vibration, heat deformation of high precision machine tools, removal of slag from processing and cooling, and lubrication have all brought about many difficulties in automation of production processes.

Secondly, because of the continued development of science and technology, the need for variation in the shape of products has become more frequent, and the percentage of multiple varieties and small batch production has increased in the entire machinery industry. Under this situation, the fixed automated processing line that is based on a certain shape of a product or a single spare part can no longer do the job. Versatile or adjustable automation (or called soft automated production line) will be included in the daily agenda. We must also study how to use mass production methods to produce many varieties of small batches of machinery products.

Third, automation of management in the machinery industry, whether managing a few varieties in large quantities or many varieties in small batches, or single unit production, is different from the continuous production method of petroleum, in the chemical industry and for electric power. It is continuous production and there is the problem of flow of reproduced products. A product consists of several dozen, several hundred, several thousand and even ten thousand spare parts. The entire production will be affected if one spare part is lacking. Therefore, the information produced everyday by the machinery industry enterprises is huge. At present, no enterprise can grasp the actual progress of production at any given time. The problem of how to realize automation of management in the machinery industry has its own special nature.

The characteristics above have brought about many difficulties in the automation of the machinery industry. Before realizing automation, a lot of basic work has to be done, and electrical appliances and machinery have to be combined well to become a whole before the work can be done well.

(I) Aimed at the actual situation of national economic development in our nation, the key point in the automation of the machinery industry is to guarantee the quality of machinery products, improve economic benefits, conserve and develop new energy sources, reduce the consumption of raw materials, shorten the period of design and testing, hasten the renovation

and replacement of products, guarantee production safety and reliability. Automation must pay attention to economic results, we must not unilaterally pursue the conservation of manpower or unmanned operation. But we must start out from the actual situation. Even if a lot of effort is involved and if a lot of investment has to be made, we must automate those sectors that are harmful to man's physical safety and jobs that cannot be operated by man.

(II) We must realize the goals of automation in the machinery industry with differentiation and in stages. The military industry and the pioneering departments should guarantee that the quality of products is in first place, we must ask for advanced design and manufacturing techniques, and some departments must develop unmanned operation. These departments can emphasize the popularization and study of new technology. The general backbone factories should consider the level of automation under technically and economically rational conditions. Medium and small factories have poor conditions for automation, production equipment is backward, and we should advocate mechanization, semi-mechanization, automation and semi-automation, to popularize currently practical technologies to mainly satisfy the requirements in production. Schools and scientific research units should lead and do some preparatory work for technology. Soft automated lines and group technology should be developed, but we should first do basic work well, first establish test points and progress steadily.

(III) Computer applications

Computer aided design is the direction of development in product design. It is an important way to change the present situation in some factories where design personnel cannot satisfy product design requirements. It can improve the level of design techniques, improve product performance, shorten design time, hasten the renovation and substitution of products, and it should be greatly popularized and advocated. We must support the computational stations in each province and city, provide computer training service, gradually let design and scientific research personnel learn to use the computer. In certain professions (such as aviation, shipbuilding, electronics, molds), departments with favorable conditions have already established points to use a system combining computer aided design and computer aided manufacturing.

The use of computers in business management involves the reformation of the management system, and establishing complete rules and systems. How to guarantee the uniqueness and reliability of the source of information, and technical preparations for gathering, organization, processing and establishment of data bank systems on the basis of the work described above involves a broad scope and we should first establish test points. We should first make preparations, then buy computers. In this way we can avoid the discovery that the computer cannot satisfy the demands after preparatory work has been done, or discover cheaper and better computers.

We should be careful in the use of computers in production process control in the machinery industry. In general, we require the computer to be steady and reliable, the operation of the machine tool to be stable, the technology to be qualified and the technical and economic results to be good. We can consider the computer only if the three conditions above are satisfied.

The microcomputer has attracted the attention of various sectors of the machinery industry because it is light, small, simple, cheap, its operation is stable and reliable, it is easy to handle, it is easy to maintain, it requires less investment and its benefits are visible. A "microcomputer craze" has begun to sweep the entire nation. The microcomputer has demonstrated its strength in matching products, data processing and local business management. The main problems in its application at present is that the quality of domestically manufactured microcomputers is not stable, the price is high, peripheral equipment is not complete, and import channels are difficult.

Although some units import chips, after changing hands and being installed into single machines, the price is also high. These affect popularization and application of microcomputers. In addition, in view of the projects currently being carried out, results of their application are few and the period is long. This is mainly because a strong development and research center has not been formed. Everyone learns from the beginning. The effective results are few and progress is slow. In the future, we should pay attention to unified planning, and make overall arrangements to hasten development.

(IV) We should utilize automation technology to develop energy conservation and energy development.

At present, the rate of utilization of energy in our nation is only about 30 percent, lower than that of industrially developed nations by about 20 percent. Our nation's energy consumption is close to that in Japan, but the industrial production value is only one fourth that of Japan. The products produced per unit of energy consumed are too few. The function of automation must be fully developed in renovating or technically improving equipment with a low thermal efficiency called "coal tigers," "electric power tigers" and "oil tigers." In the conservation of energy, the key point is the technical improvement of automatic control of industrial boilers, heaters and kilns. Industrial boilers are the major sources of productive power and thermal power of all sectors of the national economy. According to statistics, the whole nation has nearly 200,000 industrial boilers. Last year, they consumed more than 200 million tons of coal, constituting one third of total consumption of coal throughout the nation. In recent years, the automation instruments plants in Shanghai, Sichuan, Tianjin, Xian, Dalian rebuilt the automatic controls on several hundred boilers of various professions. For example, the Sian Instruments Plant installed a whole set of instruments and automatic control systems on the 4 tons/hour, 6 tons/hour and 10 tons/hour fuel fired boilers of the

Beijing Yili Foodstuff Plant. They provided a means of measurement for balancing the heat of the enterprise, strengthened management and saved the use of one 7 tons/hour boiler. The Tianjin City Automatic Instruments Company installed a system of a whole set of instruments based on the DDZ-II electrical unit meter and the single flow water level automatic control system. After half a year, 737 tons of coal were conserved, and the investment in the instruments could be recovered from the cost for coal conserved after one year. Also, for example, electric welding machines all operate idly when not used for welding. If automatic controls are used, the electricity can be automatically cut off when they are idling, and 15 percent of the electricity can be conserved. The work of using automation technology to serve energy conservation involves two aspects. One is to install automatic control instruments on existing equipment. The other is to pay attention to studying new control technologies and new types of accessory products to provide highly efficient and low consumption equipment for the various sectors of the national economy.

(V) Actively develop service for the light industry and the foodstuff industry

Some light industries and foodstuff industries require their machinery to be automated. This is partly because the output is large, the labor intensity is too high or the working conditions are too poor, while foodstuff machinery and pharmaceutical machinery also require as little manual interference as possible to maintain sanitary conditions. Some operations are complex or repetitive and the human organs cannot adapt or easily become fatigued. Some utilize machinery to improve the rate of utilization of raw materials and reduce cost. For example, cutting mutton requires the chef to hold the frozen meat with one hand enduring the freezing coldness and operate the cleaver with the other hand. Labor intensity is high, therefore the chefs generally suffer from severe arthritis, and many have deformed arms. Each person can only cut 7 to 8 plates of mutton (about 3 jin) an hour. In 1973, some twenty famous butchers worked for three days and nights to serve 1,200 foreign and Chinese guests at a banquet of mutton upon the occasion of the Asian-African-Latin American ping pong ball competition. The automatic meat cutter can cut 93 slices per minute, the efficiency is 20 times higher than manual operation. The thickness of the meat was even, the plates were filled accurately, the meat was placed uniformly and beautifully, working conditions improved, and the work was sanitary and clean. The meat cutter was exported to Japan, Hong Kong and Macau, Southeast Asia and the Americas. Also, for example, a certain plant of the former Third Ministry of Machine Building built an automatic machine to make distiller's yeast and a grinder and mixer for the Wuliangye Winery. This equipment would cost 17,500 yuan if imported. Manufacturing one by ourselves requires 12,000 yuan. The use of this equipment reduces foreign exchange expenditure, improves the output of Wuliangye wine, and increases foreign exchange income, and at the same time, it has fundamentally changed the working conditions of workers and increased labor productivity.

(VI) Take technical improvement as the center to conscientiously grasp the following tasks:

1. We should greatly fortify and develop the experience and achievements we already have, and fully develop the function of available automated equipment. We should organize efforts to solve the problems in some automated equipment so that such equipment can be used normally in production.

For example, at present, our nation already has a number of automated machinery processing lines, but the quality is not high and we should analyze each line and gradually improve each one. First, we must quickly enable those automated production lines which have not been used in production to be used in production. Automated lines which have been sealed because the products have shifted should be shifted together with the products to the new production plants, and we should help install and test them so that they can quickly begin production at the new plants. Automated lines whose products have been terminated and indeed will not be used (such as certain military products production lines) and those automated lines that are expected to be closed down for more than 5 years should be written off and dismantled. The useful parts should be used for other purposes, thus not causing waste. The automated lines that have been sealed because they did not produce enough batch produced products but can guarantee quality should be regarded as potential productive capability and in future planning, appropriate types of products should be assigned to those automated lines for production. Secondly, automated lines that are operating at a lower level should be improved so that they can be gradually elevated in standard until they can be normally used in production. Finally, those automated lines in factories that should be written off should be handled early. We should not fear responsibility and let them rust away until they become junk and then apply for permission to write them off. In the future, we must strictly grasp the conditions for establishing machinery processing automated lines. The establishment of automated lines must improve labor productivity, guarantee the quality of products, guarantee good technical and economic results. The planned production guidelines must be large enough. We must strictly prove the plans and conduct technical and economic analysis. The investment in building a line should be able to be recovered in 5 years. Only when these conditions are present simultaneously can we consider establishing an automated line.

2. We should grasp automatic testing technology.

How to utilize automatic testing technology to inspect products 100 percent and guarantee quality has become a strong demand in automation for machinery products to gain a place in the market. Our efforts in this regard are a weak link. Numerical display technology has matured. It can improve the quality of products, and we can recover the investment within a short period. We should popularize it in a big way. For example, the Shanghai Electrical Works Plant installed 2 numerical coordinates display testing devices in the T68 boring machine at an investment of 13,000 yuan. The

investment was recovered in only three and a half months. On the other hand, we must strengthen basic research in testing technology and train a specialized technical team.

3. We should conscientiously digest imported equipment and imported technology.

In recent years, the machinery industry has imported a lot of equipment. The technology of such equipment is advanced, and the level of automation is high. After the machines reached the units, some could not be used temporily because of national economic adjustment and have been warehoused for long periods.

Some have a very low rate of utilization. They should be fully utilized. First, we should open the doors, allow related units to visit and learn. All related units should be organized to digest the technical information on the large items so that each machine that is imported can produce many benefits.

4. We should improve the quality of automated basic components, reduce cost and do the work of industrialization, automation and mechanization well.

The reliability and stability of automated components, installations and systems are the life force of automation. Our nation's standardization and generalization of automated components, installations and systems lack a unified arrangement. Regions and factories are not coordinated, and interchange is difficult. To a degree, this has reduced the reputation of automation. At present, the various professions of the machinery sector are undergoing readjustment. If we do not take this opportunity to standardize, generalize and miniaturize hydraulic components, electrical components and electronic components, if we do not conscientiously improve quality, reliability and stability, then when the national economy develops in a big way and makes demands upon automation, we will follow the old road.

5. We should help medium and small factories implement automation.

There are many lcoal medium and small factories. The degree of mechanization and automation of these factories is low, production is backward, their productive potential is very great. We should organize forces, help them implement mechanization and automation well. For example, there is a lamp factory in Hunan. It is a small factory with more than 200 people. The lamps produced by that factory generate little profit, the labor productivity is low and it is difficult to continue. Later, that plant applied automation technology in a big way. The dozen or so punching machines in the stamping shop were all automated. From then on, the labor productivity of that factory improved a dozen or so times, the percentage of qualified products reached 86 percent. In 1980 alone, it submitted a profit of 450,000 yuan to the state.

6. We must emphasize the training of people.

The present trend of development is economic competititon. It is actually technical competition. Technical competition is summarized by human competition. Advanced technical equipment must possess sufficient technically skilled people to manage before such equipment can develop the efficiency it possesses. On-the-job training is a favorable measure that requires less investment and that can produce quick results. In recent years, many factories do not have sufficient production tasks. This is a very good opportunity for technical workers and cadres to leave production for a short time to learn. We should organize various types of short-term training classes, strengthen popular education for users, maintenance personnel and managers so that the development and application of automation technology can be established on a strong manpower foundation.

(VII) We should break the boundary between military and civilian sectors so that the automation technologies possessed by the military and civilian sectors can be widely exchanged and transferred.

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BRIEFS

GUODONG AT INSTRUMENT EXHIBITION--According to JIEFANG RIBAO, Chen Guodong, first secretary, Hu Lijiao, second secretary, and other leading comrades of the Shanghai Municipal CPC Committee as well as the responsible persons of various committees, bureaus and offices under the municipal CPC committee and the municipal people's government totaling more than 500 people visited the multinational instrument and meter exhibition on the evening of 15 April. Comrades Chen Guodong, Hu Lijiao and others visited the Chinese Hall first. Comrade Chen Guodong congratulated the engineers and technicians of those units participating in the exhibition for their scientific achievements and encouraged them to work harder than ever to scale new heights in science and technology and to further improve the quality of Chinese meters and instruments. After visiting the Chinese Hall, Comrades Chen Guodong and others visited the halls of the other 15 nations one-by-one and thanked the attendants at each hall for their hard work in making this exhibition a success. Zhou Jiannan, minister of machine building, also visited the exhibition last night. [Text] [OW170224 Shanghai City Service in Mandarin 2300 GMT 15 Apr 83]

CARRIER COMMUNICATION SYSTEM--The Huabei Oil Field Exploration and Development Design Institute and the Electric Power Research Institute of the Ministry of Water Resources and Electric Power have recently joined forces in developing a 35 kilovolt cylindrical coaxial cable carrier communication system. They have also installed the first 7.5-km system circuit in this country. Inspection of the new system by more than 40 units organized by the Ministry of Petroleum Industry and the Minitry of Water Resources and Electric Power indicate that it performs satisfactorily both in power transmission and in voice and signal transmission. The system is recognized as a new technology for solving communications channel problem using electric power circuits; it fills a gap in China's electric power communication system. [Text] [Shijiazhuang HEBEI RIBAO in Chinese 28 Mar 83 p 1] 3012

CSO: 5500/4143

TENTATIVE PLANS FOR MEDICAL EDUCATION REFORM SEEN

Beijing JIANKANG BAO in Chinese 23 Jan 83 p 3

[Article by Wu Su [0702 5685], Fang Hongxing [2075 1347 5281], Xie Songling [6200 2646 7881], Xia Liye [1115 7812 2814]]

[Text] In the narrow sense, the goal of reform of college medical education is to adapt it to the mold of modern medicine to raise the level of teaching and scholastic standards (in recent years, some people have suggested the development of the biomedical model into the bio-psycho-socio-medical model). In a broad sense it is to establish a medical education organization and system, having special Chinese characteristics, suitable for the needs of socialist modernization construction, and guided by Marxism-Leninism and Mao Zedong Thought. In order to reach this goal, there should first be a planned change in the structure of medical education to reform the system of admissions, distribution, and the salary of the graduates. Second, the history of the 30 plus years' development of medical education since the liberation should be summarized, along with experiences and lessons of educational reform. Third, whatever is beneficial in medical education in foreign countries should be studied in order to consider its adoption in China. Four, ideas of reform that conform to the reality in China should be proposed and put to the test. The authors believe that in order to gain experience, the reform of China's medical education should first proceed from the following aspects:

(1) The curriculum should be improved to add humanities, social sciences, and psycho-socio-medicine. Education in mathematics and natural sciences should be reinforced to broaden the knowledge of students. This [reform] will produce far reaching and deep effects on the structure of reasonable knowledge of medical scientists in the next generation. The curriculum is the concretion of the training target. With the development of the modern model of medicine, the structure of the curriculum must be reformed accordingly. In China, the curriculum of medical colleges has remained unchanged for many years. The small changes which have occurred are only internal adjustments within the realm of biomedicine showing a "symptom of new-course deficiency," especially a "deficiency in humanity courses." The basic objective of a medical education dictates the necessity of some medical humanity courses. What a physician faces is not only disease, but also a human being, psychologically active, and situated in a given natural and social environment. A physician should not only "administer drugs according to symptoms," but also "readjust the patient's

psyche and behavior to help him be better adjusted to social living in order to become a useful member of society peacefully, physically, spiritually, and socially.

(2) The teaching materials should be reformed to promote intellectual development. This is an important aspect of educational reform. The development of medicine in China is to be determined by nurturing and using medical talents but with intellectual education as the core of talent development. The so-called education of the mind is, through processes of education, an arming of the brain of human beings with advanced social thoughts, scientific technologies, and cultural knowledge so that they can adjust to the continuous changes of socioeconomic, political, cultural, and living aspects, so that they can adjust to as well as promote the development trend of the "knowledge explosion." For this reason, in the process of educational reform, attention should be given to the unity of transmitting knowledge and developing the intellect. There should be no division between the two. The intellect is the tool of knowledge development; therefore, nurturing students' intellect should be stressed to make medical colleges of China places "of exploring human brain power." There are many ways to nurture the intellect but the essential way is to improve the quality of educational materials, which [must meet] strict ideological and scientific requirements.

(3) The teaching method must be reformed. This is the important link in nurturing the students' intellect to raise the quality of education. Someone has suggested the viewpoint that "the cultivation of the mind is the education of wisdom and mental power; that is cultivation of intelligent human beings." On the basis of this proposal, the emphasis of mind cultivation should be shifted from primarily the transmission of knowledge to the development of the students' intellect. In a word, the students should not only be given gold but also the "Midas touch." The students should not only be given the wealth of knowledge but also the key to unlock the treasure house of knowledge.

(4) The educational reform must involve the school system, the system of regulations, and the aspects of student admission and distribution. The strengths and weaknesses of the school system have a close relationship with the goal of cultivation. This problem in educational reform cannot be overlooked. In China, more than 30 courses must be completed within a 5-year period. The total learning time is tremendous (as many as 3,900-4,000 hours in the first 4 years, about 1,000 hours more than such fields as engineering, agriculture, literature, or other sciences). If more new courses are developed, something will have to give. If the student's load is made even heavier, their free time will be further reduced. We, therefore, believe that aside from the need of concentrating and simplifying the contents of various courses, the school period should be properly lengthened. According to the condition of China, aside from a few 8-year colleges, a province may change a college with suitable conditions into a 6-year system. In a 6-year system, considerations may be given to emphasis on mathematics, physics, chemistry, biology, and general psychology courses in the 1st year; basic courses of medicine in the 2nd and 3rd years; clinical courses in the 4th and 5th years; and graduate practice in the 6th year. The basic courses of medicine and the clinical courses may proceed alternately; they must not be sharply separated.

Then, the related system of regulations must adapt to and promote the needs of educational reform. For example, in student admission, the attention must be on raising the quality of students in medical schools. The system of grading and promotion should also be changed correspondingly, for example, adopting, in part, the course-credit system. When the medical school system is changed into 6 years, the salary of the graduates should not be the same as that of the 4-year system. It should suitably be raised higher.

6248
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PROBLEMS, RESOLUTIONS IN HOSPITAL WORKING CONDITIONS VIEWED

Chengdu SICHUAN RIBAO in Chinese 2 Apr 83 p 1

[Text] When Wang Chenghan [3769 6134 3352] a commander of the Chengdu PLA Units came to investigate conditions and study at the unit general hospital, he resolved five great problems for the intellectuals working at that hospital. Their political enthusiasm has thus aroused. They are to work hard to contribute to start a new phase at the hospital.

Late January, Commander Wang Chenghan and Niu Ji [3662 2345], deputy political committee member, brought a work team to the General Hospital to investigate conditions and study. They discovered there that the function of intellectuals was not well utilized and there remained some problems: (1) The pace of change of young and old intellectuals was too slow. Middle-aged intellectuals of true skill and learning were not placed in important positions and some old intellectuals were not taken care of appropriately. (2) The phenomenon of "eating out of a big common pot" still existed. Outstanding achievements were not praised and those not attempting to get ahead were not encouraged. (3) The team of intellectuals had no successors. Young intellectuals were mostly graduates of the short course learning system. Their basic knowledge was poor and the cultural level was not high. (4) Although many of the old nurses had long been the technical backbone of the hospital, they had never undergone training in a specialty school system. Their lack of formal education affected promotions and transfers. (5) Some intellectuals had housing difficulties; their living conditions were relatively poor.

Faced with these problems, Commander Wang and deputy committee member Niu, with the comrades of the work team, called several symposia, participated in by all types of hospital personnel to propagandize to the cadres and masses the position and function of intellectuals. The importance of holding knowledge and intellectuals in high esteem was stressed. They also studied jointly with the hospital party committee and related departments to reach a decision on carrying out the following items immediately: (1) Before the end of March of this year, the leaders of all ranks of the hospital should be readjusted to promote those middle-aged intellectuals with experience, energy, and true knowledge to leadership positions. (2) The old specialists and old professors, thus retired, should be organized to establish an office of specialists, with their salaries, titles, and treatment unchanged so that they may continue to exercise their function of technical guidance. (3) Those intellectuals who have studied diligently and made obvious progress in research should be loudly praised and

commended and the outstanding ones may be promoted ahead of schedule. (4) The Military School of Medicine should be responsible for launching training classes of a 3 1/2-years duration to supplement the basic knowledge in specialties for the graduates of the hospital's short-learning system. (5) Those old nurses who have never gone through training in a specialty school system should be given specialty occupational training and be given examinations according to the nurses' training requirements of regulation intermediate schools. The qualified ones should be issued graduation certificates to acknowledge their educational status. (6) The construction this year of an additional dormitory building housing 60 households at the general hospital was approved in order to resolve the housing problem of technical personnel of grade 9 and above. At present, some of these measures have been carried out; while others are being urgently implemented.

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LIFE SCIENCES

PROVINCIAL MEDICAL SPECIALISTS, PROFESSORS TRAIN MEDICAL CONTINGENT

Chengdu SICHUAN RIBAO in Chinese 12 Feb 83 p 2

[Text] In the past year, Sichuan College of Medicine, Chongqi College of Medicine, Sichuan University, Chengdu College of Chinese Traditional Medicine, and Sichuan Provincial People's Hospital dispatched, successively, 33 specialists and professors to teach courses at the public health staff training classes, organized by the Chengdu PLA units. They enthusiastically helped the troops train a medical contingent composed of middle-aged persons.

Late February of last year, the Chengdu units launched a public health centralized training class for middle-aged intellectuals. The Unit Rear Service Department requested assistance from the five colleges and hospitals of Chengdu and Chongqing. Their enthusiastic support was obtained. They believed that contributing to the medical modernization of the military is a responsibility they cannot possibly decline. They selected 33 famous specialists and professors with clinical as well as educational experiences to form a teaching staff to lecture and to prepare courses for the units so as to transmit their precious knowledge. In the past year, these specialists and professors taught a total of 600 plus hours, amounting to 70 percent of the total course load of the centralized training class.

These specialists and professors all have heavy responsibilities of teaching and clinical work. They squeezed out time to prepare lessons and earnestly to transmit medical knowledge to the unit members of the class without holding back anything. Professor Zhang Guangru [1728 0342 0320], the 67-year old deputy director of Sichuan College of Medicine Hospital, who served as the head of the rescue team for the Japanese mountain climber team in May of last year, wrote letters to the centralized training class three times, in spite of his busy work schedule, in order to learn the problems of the students in order to prepare related teaching materials. His lectures were consequently vivid as well as practical and won the acclaim of the students. When Wang Xizhong [3769 0823 1813], a lecturer of the Department of Biology, Sichuan University, accepted the job to teach the units' centralized training class, it was during the Spring Festival. He gave up his holidays to prepare the lessons. Whenever he finished a lesson, he went among the students to provide individual guidance, to let them ask him questions, and to resolve any difficult problem. He would not stop until each student understood the lesson completely. The female professor Lin Qi [2651 3823] of the Department of Internal Medicine, Chongqing College of

Medicine, possesses rich clinical and teaching experience. She rushed from Chongqing to Chengdu to teach the course. As soon as she got off the train, she went first to the Unit Hospital to find patients with difficult diseases. During the class, she brought the students to the ward to teach them in conjunction with treating these patients so that the course was both vivid and concrete.

These specialists and professors passed on with this teaching process the most advanced medical treatment technology to the unit students. Prof Luo Decheng [5012 1795 6134], the internal medicine specialist and dean of Sichuan College of Medicine and Prof Deng Changan [6772 7022 1344], the head of the Department of Internal Medicine just returned from an inspection tour of the United States. Both of them used the results of their foreign observation to explain to the students new foreign techniques of treating coronary disease, rheumatic heart disease, hemorrhagic diseases and leukemia, anemia, etc. They were well received by the students.

These specialists and professors painstakingly taught these courses so that the students of the centralized training class might improve in the aspects of basic theories, specialized knowledge, and clinical application. At the final examination, the grade average of the students reached 89. Everyone of them also wrote a specialized medical paper, based upon their own clinical experience.

6248
CSO: 4008/89

AUTHOR: YANG Xuezhi [2799 1331 3112]

ORG: None

TITLE: "The LH Series of Low-Speed, High Interference-Resistant Logic Integrated Circuits"

SOURCE: Beijing WUXIANDIAN [RADIO] in Chinese No 3, 11 Mar 83 p 13

ABSTRACT: In cooperation with Zhengzhou University, Beijing Communications Component Plant Ministry of Post and Telecommunications has succeeded in making a new kind of integrated circuit, the LH series of low-speed, high-interference-resistant logic integrated circuits (LH circuits for short.) They have very high DC noise tolerance and at the same time very good capability of pulse interference resistance. Their output load capacity is high; they can directly drive a 24V small DC relay. The circuit can be conveniently linked with PMOS, CMOS, TTL, DTL, ECL, HTL, etc. to form the input and output to realize level transforming, to remove interfering signals, to improve the reliability of the entire system, and to reduce cost. LH circuit may be used in automatic control devices of post-telecommunication, transportation, metallurgical, machinery, textile, chemical, and food industries. At present, LH circuits have been certified and are being produced in batches.

AUTHOR: GU Bingxin [7357 3521 9515]

ORG: None

TITLE: "DZ-1 Portable Electronic Acupuncture Treatment Instruments"

SOURCE: Beijing WUXIANDIAN [RADIO] in Chinese No 3, 11 Mar 83 p 13

ABSTRACT: Shanxi Radio Plant No 2 has succeeded in producing the DZ-1 portable electronic acupuncture therapeutic instrument. It is a low-frequency instrument, performing a function in between acupuncture and massage. It does not require a needle to be inserted in an acupuncture point. Instead, it applies pulse information on the acupuncture point of the human body to produce a low-frequency stimulation closely in uniformity with the pulse of the human body to cause the "nerve wave" inside the body to be excited, the blood to flow freely, the subcutaneous or the automatic nervous system to be more activated so as to promote blood circulation, to clear up the Jing and Le, to harmonize the air and the blood, and to produce analgesic and tranquilizing effects. The instrument is basically an intermittent oscillator, with a pulse frequency of 1-2Hz, a pulse amplitude of 50-100V, and a pulse width of 10-500 μs. It is small and light and operates on a 9v integrated battery, with a maximum output power of 0.09w. The battery will last half a year. The instrument has been certified for small batch production.

6248
CSO: 4009/154

AUTHOR: ZHANG Shiduo [1728 1102 6995]

ORG: Tongji University

TITLE: "A Proposed Crack Formula for Reinforced Concrete Beams Under Short-term Loading"

SOURCE: Beijing TUMU GONGCHENG XUEBAO [CHINA CIVIL ENGINEERING JOURNAL] in Chinese No 1, 1983 pp 33-40

TEXT OF ENGLISH ABSTRACT: At present, tens of formulas for computing the cracking opening and interval of reinforced concrete beams under short-term loadings have been published by different authors. In this paper, the existing theories concerning the evaluations are briefed, followed by a review of the main ones which are generally used. Based on the analysis of the current codes of buildings, highways and railway bridges in China, a suggestion is made here for modification of the present crack formula in the codes.

AUTHOR: XIE Nianxiang [6200 1628 4382]
LU Ruizhen [4151 3843 3791]

ORG: East China Water Conservancy College

TITLE: "Revision of the Criteria for Acceptance of Concrete Strength in Harbor Engineering"

SOURCE: Beijing TUMU GONGCHENG XUEBAO [CHINA CIVIL ENGINEERING JOURNAL] in Chinese No 1, 1983 pp 82-89

TEXT OF ENGLISH ABSTRACT: The revision of the Tentative Criteria for Acceptance of Concrete and its compressive strength in harbor engineering projects is reported, and the practicality of the new article is examined theoretically by equiprobability of defined indexes for acceptance or rejection. According to the concrete strength data of more than 200 projects in harbor engineering, a comparison is made by statistic analysis and sampling characteristic curves for an appropriate practicality between the corresponding articles formulated in the National Standard (GBJ10-65), the Ministry Tentative Criterion (1978) and the revised criteria in question. It is concluded that the revised article is appropriate for the present engineering practice and, moreover, the safety of engineering quality is better managed.

9717
CSO: 4009/152

AUTHOR: None

ORG: Research Institute of Machine Tools, Ministry of Machine Industry

TITLE: "Overall Adoption of International Standards Has Begun in the Machine Tool Industry"

SOURCE: Beijing BIAOZHUNHUA TONGXUN [STANDARDIZATION JOURNAL] in Chinese No 2, Feb 83 pp 2-5

ABSTRACT: Since 1977, standards of machine tool products have been thoroughly overhauled, producing 193 basic standards and 524 standards of parts and components. These standards have had good effects on developing types of products, improving their quality, strengthening production management, expanding export trade, raising economic benefits, and guaranteeing production safety. The experience of the process of adopting international standards is summarized as follows: (1) Collect, translate, and publish international and advanced foreign standards; (2) Analyze and compare domestic standards with international standards; (3) Learn international standards and verfify them through production; (4) Adopt measures suitable under existing condition of production; (5) Provide necessary designs and work processes and add key equipment; (6) Do not acquire equipment unsuitable for products; (7) Organize technical manpower to make basic and common terms of international standards incorporated into the terminology of Chinese standards.
This paper is an excerpt from Experience Materials of Symposium International Standard Experience Exchange and Regulation Formulation.

AUTHOR: ZHANG Yunqi [1728 0061 3305]

ORG: None

TITLE: "Second National Conference of International Standards Popularization Work Held in Zhenjiang"

SOURCE: Beijing BIAOZHUNHUA TONGXUN [STANDARDIZATION JOURNAL] in Chinese No 2, Feb 83 p 5

ABSTRACT: The Second National Conference of International Standards Popularization Work was held on 24-28 Nov 82 in Zhenjiang of Jiangsu Province. Participants included 132 delegates of various committees, authors, and associations of standardization. The work condition and experience of various places and departments since the first conference in Dec 79 were exchanged. Aside from using such forms as learning classes, publications, window displays, the conference was told that such channels as local newspapers, broadcasting stations (radio) and television programs have also been adopted to teach standardization. Songs, poems, and motion pictures on the subject have also been created in cities as well as the countryside. The traditional form of small discussion meetings was abandoned as the medium during this conference; instead there were small exhibits to demonstrate to the delegates the propaganda work and its effects carried out in various localities. The conference asked the standardization associations of all localities to continue to develop and perfect all forms of propaganda, concentrating of the fact that standardization is necessary for the national economic construction and scientific and technological progress.

6248
CSO: 4009/136

AUTHOR: LIANG Zengbiao [2733 1073 6977]

ORG: None

TITLE: "Hydraulic, Pneumatic Components Planning Conference Held in Beijing"

SOURCE: Dalian ZUHE JICHUANG [MODULAR MACHINE TOOL] in Chinese No 2, 25 Feb 83 p 9

ABSTRACT: The Bureau of General Basic Components Industry Ministry of Machine Industry called a long-term planning symposium for hydraulic pressure, hydraulic power, and pneumatic components industries in Beijing, on 10-15 Jan 83. Opinions of long-term planning and arrangement of the leaders of the ministry and the bureau were relayed. The participants were asked to discuss the contents of the long-term plan, formulate methods and schedules for its implementation, discuss the technical development policy of the industry, and the policy of technical, work process, and equipment reforms. The following are regarded to be essential: (1) The technical level of the world of the late 70's and early 80's must be reached by 1988 and the quality of products must reach current international general standards by then; (2) Introduction from foreign countries, imitation of foreign products, and the industry's own designing should be combined; (3) Open up potential markets and try to supply complete systems; (4) Gradually reorganize the production structure to make it more rational; (5) Positively extend advanced technology and results of scientific research; (6) During and before the 7th 5-year plan, develop and improve technologies on the foundation of digesting and absorbing introduced technologies. The participants analyzed and compared domestic and foreign levels of the industry and formulated targets for the 7th 5-year plan and for the year 2000. Measures for realizing these targets were proposed.

AUTHOR: WANG Muqin [3769 1970 4440]

ORG: None

TITLE: "Conference to Examine State's Standards for Slip-on Casing Type Pipe Joints Held in Haiyan County, Zhejiang Province"

SOURCE: Dalian ZUHE JICHUANG [MODULAR MACHINE TOOL] in Chinese No 2,25 Feb 83 p 47

ABSTRACT: The national standard slip-on casing type pipe joints, formulated by a group organized by the Standardization Center of Ministry of Machine Industry with the participation of the Modular Machine Tool Research Institute, had undergone more than 3 years of work. On 28 Nov - 2 Dec 82, a conference was held in Haiyan County to examine it. The participants represented 52 units of related departments, factories, research institutes, and universities. National General Bureau of Standards also sent representatives. Following extensive discussion, the standard was approved and the draft document will be edited by the National Standard Work Group before presenting to the National General Bureau of Standards. This draft standard was formulated on the foundation of the original ministerial standard, with test-proofing of many items and with reference to ISO basic elements. Its official enactment will facilitate international exchange and trade.

6248
CSO: 4009/155

AUTHOR: GAO Fulin [7559 4803 7792]
LI Zhidan [2621 1807 5106]

ORG: None

TITLE: "A BASIC Language Program for the Calculation of Theoretical Electric Drilling Curve of Coalfield, Using the Digital Filter Method"

SOURCE: Xuzhou ZHONGGUO KUANGYE XUEYUAN XUEBAO [JOURNAL OF CHINA INSTITUTE OF MINING TECHNOLOGY] in Chinese No 1, 25 Mar 83 pp 36-47

ABSTRACT: When electric stratal parameters are known, 2 methods may be used to calculate the electric drilling curve on a computer: One is to use the STEFANESCO formula; the operation takes about 25 minutes on an INTERDATA8/16. The other is to use the digital filter method proposed by Ghosh, a Dutch geophysicist. An ALGOL-60 program , using 131 filter coefficients, has been made operational on the Chinese DJS-6 computer. This paper reports a BASIC language program, written by the authors to run on the Chinese mini-computer DJS-130. In order to simplify the program, 2 filter coefficients of large sampling intervals are used to proceed with convolution with electric resistivity functions of smaller sampling intervals. The fundamental theory of this method of calculation and the actual results obtained on a DJS-130 are introduced, with the mathematical model and the BASIC language program [in English] included. The program may run on a portable computer; therefore, is suitable for field work.

AUTHOR: None

ORG: None

TITLE: "National Conference on Power Leak Protection in Coal Pits Held in the Institute"

SOURCE: Xuzhou ZHONGGUO KUANGYE XUEYUAN XUEBAO [JOURNAL OF CHINA INSTITUTE OF MINING TECHNOLOGY] in Chinese No 1, 25 Mar 83 p 59

ABSTRACT: The National Conference on Power Leak Protection in Coal Pits, sponsored by the Technology Division of Ministry of Coal was held in the institute on 4-7 Nov and attended by 83 delegates of 37 related manufacturing plants of bureaus of mines, research institutes, designing academies, and colleges of the coal system. Researches on electricity leak protection in the past 3 years by the institute were given high praise by the delegates. Following extensive discussion, 13 research projects were proposed, including manufacture of DC power leak relay, research on underground low voltage power mains, insulation resistance [and] operation resistance values, etc. Associate Prof XIE Guilin [6200 2710 2651] proposed the establishment of a Coal Mine Electrical Safety Research Committee of China Society of Coal and won enthusiastic support from the delegates.

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CSO: 4009/153

END